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**14. ABSTRACT**

The objectives of this proposed study are to 1) Coordinate medical care to meet the physical and mental health needs of OIF/OEF veterans with injuries incurred in combat 2) Determine the immediate and sustained effects of telerehabilitation on patient outcomes on a variety of physical, psychological and social functions over the period of study 3) Examine the perceived benefits and limitations of the telerehab from the veteran and caregiver perspectives and 4) Evaluate the effectiveness of telerehab on health outcomes and resource utilization

**Study design:** This 3 year study will use a prospective observational design to extend the present study at the Tampa VA to 1) recruit 60 veterans each at the Tampa and Miami VA hospitals divided equally among the two groups receiving telerehab and those with traditional care acting as controls at each site. **Methods:** We will utilize qualitative and quantitative analysis for evaluating changes in functional and mental health status, community participation, VA healthcare utilization, and veteran/family perceptions of telerehab.

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## **Purpose and scope of the research effort.**

**Goals:** This is one project in a planned program of research to improve care for injured Operation Enduring Freedom/Operation Iraqi freedom (OEF/OIF) veterans. Building on the successful, currently funded, CDMRP study “Effectiveness of Telerehabilitation for OIF/OEF returnees with Combat Related Trauma”: W81XWH08-2-0091 we propose with this research to extend our analysis to evaluating the effectiveness of the telerehabilitation intervention for veterans with combat related trauma. We plan to test its effectiveness with a cohort of OIF/OEF returnees discharged from the James A Haley Veterans Hospital in Tampa, FL (Tampa VA) and the Bruce B Carter VA Medical Center at Miami (Miami VA).

The *long term* goal of this program of research is to optimally define telerehabilitation services for all veterans with polytrauma, including accurate and efficient screening instruments, educational material for patients and families, family support, and family counseling to enhance care coordination and to maximize functional outcomes and quality of life.

## **Overall progress to date and problem areas**

### **Statement of Work**

#### **Obtain Institutional Review Board and conduct literature review.**

1) Modified IRB and Informed Consents for the study have been approved by the University of South Florida and the Miami VA to facilitate enrollment of subjects. All required documents for project approval have been forwarded to USAMRMC. Clearance has been obtained from HRPO (DoD) to commence our study.

#### **Care Coordination Team**

Our telerehabilitation care coordination team is organized under Steve Scott, MD, Chief Physical Medicine and Rehabilitation Services VA at the Tampa VA and Stuti Dang, MD at the Miami VA. Vilma Rosada, RN is in charge of care coordination and recruitment of combat wounded OEF/OIF veterans via telerehabilitation at Tampa. Assisting her are William Lapcevic, MSST, MPH an expert in information technology and data management together with Steve Moore MS, website coordinator. Andrea Spehar, JD, DM, MPH will be the project manager at the Tampa VA. Ms. Blanco Barreto, RN is the care coordinator efforts at The Miami VA.

#### **Data collection and Care Coordination.**

Instruments for data collection will be posted on SurveyMonkey a commercial website that was cleared by VA Information Security at the James Haley Veterans Hospital as meeting the requirements for a secure data gathering portal. Details on SurveyMonkey can be found at [surveymonkey.com](http://surveymonkey.com). Participants in the study will access the website to answer surveys which will be downloaded and maintained in SAS datasets for analysis purposes. We maintain a secure messaging website hosted at VA WebOps that serves as the main conduit for communication between care coordinators and study enrollees. Separate “virtual rooms” have been setup on the

VA server to facilitate care coordination at the two sites without compromising patient confidentiality. At least once a week communication will be initiated between care coordinators and study participants.

*Monitoring health outcomes:* Veterans are required to connect (via the internet) to a secured commercial website (SurveyMonkey<sup>R</sup>) to provide, periodically, repeated measures of response to a variety of instruments to monitor their health outcomes over time including the Functional Independence and Functional Assessment Measure<sup>TM</sup>, the Craig Handicap Assessment and Reporting Technique Short Form, The Mayo-Portland Adaptability Inventory, the Patient Health Questionnaire, the Patient Competency Rating Scale, the PTSD Checklist Civilian Version, Short Post-Traumatic Stress Disorder Rating Interview, Self-Report Alcohol Use Disorders Identification Test & SF-12 Health Survey.

### **Patient Recruitment**

We have recruited a total of 60 veterans at the Tampa VA equally divided between the intervention and control group who meet the inclusionary criteria. Fourteen veterans from Tampa have dis-enrolled from the study: 7 subjects moved out of state, 5 did not respond to requests to complete surveys, one has been incarcerated by law enforcement and another passed away. As of this date, 60 subjects have been recruited in Miami (13 veterans have been dropped, 11 moved out of state and 2 did not responds to requests to complete surveys).

## **Body**

### **Statement of Work**

#### **Effectiveness of Telerehabilitation for OIF/OEF returnees with Combat related Trauma.**

*Task 1.* Administrative tasks, Months 1-3

**Completed**

- a. Obtain Institutional Review Board and conduct literature review.
- b. Recruit care coordinator (ARNP) and program manager at the Miami VA facility.
- c. Order computers, load software programs/survey instruments and set up web site on VA servers.
- d. Recruit veterans for the control group at the Tampa VA.

*Task 2.* Patient recruitment and programming, Months 3-32:

**Completed**

1. Finalize list of all OEF/OIF returnees discharged from the Miami VA with a primary or secondary diagnosis of TBI.
2. Contact (phone/internet/mail) patients who meet inclusion criterion and agree to participate in telerehab and have informed consents signed at the Tampa and Miami VAs.
3. Provide access privileges to enrollees to telerehab website.

*Task 3.* Data Collection: Months 5-72.

**Ongoing**

1. Abstract from the Veterans' health Information Systems & Technology Architecture (VistA) medical record abstracts pertaining to health care utilization and treatments of combat wounded veterans.
2. Abstract from the VA Decision Support System (DSS) cost estimates of VA Health Care Utilization.
3. Obtain responses to instruments to capture function, cognition, ability, integration into society
4. Conduct patient/caregiver satisfaction surveys and perceptions on facilitators and barriers to telerehabilitation.

*Task 4.* Data Analysis: Months 36-72.

**To be started**

- a. Conduct multivariate statistical analysis and economic modeling to:
  - a) Determine changes in functional/cognition and community integration
  - b) Characterize changes in status of Post Traumatic Stress Disorders.
  - c) Identify changes in patterns of healthcare utilization and associated costs
  - d) Evaluate the cost effectiveness of telerehabilitation.

- b. Conduct interviews to synthesize facilitators and barriers to providing telerehabilitation for TBI.

*Task 5.* Report Writing: Months 66-72

**To be started**

- a. Prepare final report and initial manuscripts.



## **Patient Recruitment**

Table 1 indicates subject characteristics of all 120 veterans enrolled in the study at the Tampa and Miami facilities. This report summarizes our findings for the veterans who completed baseline surveys. 9 veterans of the 120 were female. Females cannot be enlisted in combat units but do sustain injuries due to accidents and indirect fire. A majority of veterans enrolled classified themselves as white (N=96), 82% Non-Hispanic in Tampa and 67% Hispanic in Miami. The mean age (standard deviation) was 33.6 (8.9) in Tampa and 32.7 (10.3) in Miami.

**Table 1: Subject Characteristics (N=120)**

	<b><i>Tampa</i></b>	<b><i>Miami</i></b>
<b>Gender</b>	<b>N (%)</b>	<b>N (%)</b>
<i>Female</i>	4 (6.7)	5 (8.3)
<i>Male</i>	56 (93.3)	55 (91.7)
<b>Race</b>		
<i>Black</i>	12 (20.0)	8 (13.3)
<i>Native American</i>	1 (1.7)	0
<i>Native Hawaiian</i>	1 (1.7)	0
<i>White</i>	46 (76.7)	50 (83.3)
<i>Unanswered</i>	0	2 (3.3)
<b>Ethnicity</b>		
<i>Hispanic</i>	11 (18.3)	40 (66.7)
<i>Non-Hispanic</i>	49 (81.7)	20 (33.3)
<b>Age</b>		
<i>18-29</i>	26 (43.3)	26 (43.3)
<i>30-39</i>	18 (30.0)	25 (41.7)
<i>40-49</i>	12 (20.0)	7 (11.7)
<i>50+</i>	4 (6.7)	2 (3.3)
<b>Age - Mean (SD)</b>		
<i>N</i>	60	60
	33.6 (8.9)	32.7 (10.3)

## **Baseline Surveys**

Baseline surveys were conducted to: 1) To characterize rehabilitation trajectories over time in the areas of function, cognition, psychosocial adjustment, integration into society and mental health disorders over time and 2) To individualize treatment patterns customized to each veterans needs so as to maximize the effect of telerehabilitation. Unlike traditional telemedicine that deals with disease specific monitoring or intervention (diabetes, CHF, dementia etc), our cohort exhibits a very diverse population in terms of disease affliction, complexity and propensity to receive care.

## Survey Instruments

There are nine survey instruments to be completed by study subjects at six month intervals starting with baseline surveys while enrolled in the study. The Functional Independence Measure and Functional Assessment Measure (FIM/FAM); Craig Handicap Assessment and Reporting Technique - Short Form (CHART-SF), The Mayo-Portland Adaptability Inventory (MPAI-4); Patient Health Questionnaire (PHQ & PHQ-2), The Patient Competency Rating Scale (PCRS); The PTSD Checklist - Civilian Version (PCL-C); Short Post-Traumatic Stress Disorder Rating Interview (SPRINT); Alcohol Use Disorders Identification Test (AUDIT); and the SF-12 Health Survey (SF12). The surveys will all be administered at baseline, 6-months and 12-months. The Patient/Caregiver satisfaction surveys are conducted after 12 months of continuous enrollment in telerehabilitation. To date, 60 enrollees in the Telerehab intervention and 59 others in the control group have completed baseline survey instruments. The corresponding 6 month survey completions pertain to the intervention (n=56) and in the control group (n=57). Twelve month survey completions are 52 in the study and 56 in the control group. Some of the key survey instruments utilized are summarized below:

1. **Mayo-Portland Adaptability Inventory-4 (MPAI-4)<sup>1</sup>:** Assures that the most frequent sequelae of TBI are considered for rehabilitation planning or other clinical interventions. MPAI-4 items represent the range of physical, cognitive, emotional, behavioral, and social problems that people may encounter after TBI. MPAI-4 items also provide an assessment of major obstacles to community integration which may result directly from TBI as well as features of the social and physical environment. Now in its fourth revision, the MPAI-4 and its three subscales (Ability Index, Adjustment Index, Participation Index) offer measures with highly developed and well documented psychometric properties<sup>2</sup>. The Ability index comprises components such as vision, Motor speech, verbal communication, attention concentration memory and problem solving, the Adjustment index measures anxiety, irritability, anger, fatigue, pain and headaches, sensitivity and impairment while the Participation index captures Initiating activities, social contacts with friends, leisure and recreational activities, self-care, transportation, employment and managing money and finances.
2. **The Alcohol Use Disorders Identification Test (AUDIT)<sup>3</sup>:** The AUDIT was developed by the World Health Organization to identify persons whose alcohol consumption has become hazardous or harmful to their health. The AUDIT is a 10-item screening questionnaire with 3 questions on the amount and frequency of drinking, 3 questions on alcohol dependence, and 4 on problems caused by alcohol.
3. **Craig Handicap Assessment and Reporting Technique - Short Form (CHART-SF)<sup>4</sup>:** In 2000, the developers of CHART (Craig Handicap Assessment and Reporting Technique), designed and tested the CHART Short Form (SF). To reduce the number of questions in CHART a multi-dimensional analysis plan was designed. First, using data already gathered from a previous study, item-scale and item-total correlation coefficients were calculated for each scale. Second, regression analysis was performed on each subscale with the dependent measure being the scale score and the variables contributing to the subscale acting as the

predictor variables. It was hypothesized that each subscale score could be accurately be predicted by fewer items. With two exceptions, the only variables that were selected to be in a subscale were those that entered into a stepwise regression model together explaining over 90% of the variance. Third, once the items had been selected for each subscale, the items were re-scored. Each subscale was computed to have a maximum score of 100, which indicates no handicap in that domain. Furthermore, efforts were made to keep all of the score weightings of the variables proportionate to the original weightings. Fourth, the CHART Short Form items and scoring were evaluated on 1800 persons that contributed to the Behavioral Risk Factor Surveillance System's survey of Colorado residents. As a result, the CHART SF has 19 items that yield the same subscales as the original CHART (32 items).

Listed below are some of the findings relating to outcome measures from the MPAI-4. They concisely describe the cohort followed and are similar in findings to other instruments used to measure outcomes. The effect of our telerehabilitation intervention appears to have had an impact on symptoms associated with substance abuse (AUDIT). Though the intervention and control group showed improvements the drop in alcohol consumption is more pronounced among veterans in the intervention group. The composite score for the AUDIT indicates lessening alcohol abuse among those with the telerehabilitation intervention. Veterans enrolled in the intervention arm of the study reported progress in social integration as measured by the CHART assessment.

#### Mayo-Portland Adaptability Inventory-4

TAMPA Mean ± STD	BASELINE		6 MO		12 MO	
	N=30 STUDY	N=29 CONTROL	N=28 STUDY	N=28 CONTROL	N=26 STUDY	N=27 CONTROL
MPAI-4: Ability Index Score	17.2±9.39	17.4±10.06	15.9±8.47	16.1±8.37	15.5±8.55	16.2±10.52
MPAI-4: Adjustment Index Score	21±9.7	24.3±10.69	20.1±8.54	23.1±9.78	19.7±8.93	22±11.49
MPAI-4: Participation Index Score	8±6.39	9.9±7.28	8.1±5.36	9.2±5.81	8.5±5.72	9±5.89
MPAI-4: Total Score	41±20.92	46±22.63	39±18.08	42.9±18.82	38.6±18.76	41.9±22.63
MPAI-4: Total T-Score	50.7±7.85	52.5±8.39	50.3±6.37	51.4±7.42	50±7	51.1±8.56
MPAI-4: Ability Index T-Score	50.2±9.43	49.7±11.08	49.3±7.79	48.9±9.55	48.7±8.39	49±10.66
MPAI-4: Adjustment Index T-Score	52.7±8.29	55.8±9.25	52.4±6.95	54.6±8.15	51.8±7.43	52.9±11.95
MPAI-4: Participation Index T-Score	40.8±15.25	44.4±15.78	42.1±12.42	43.3±14.67	43.7±10.63	42.6±14.74
Mobility: Problems walking or moving; balance problems that interfere with moving about.	1.6±1.22	1.7±1.2	1.6±1.1	1.6±1.2	1.8±1.27	1.4±1.18
Use of hands: Impaired strength or coordination in one or both hands	1±1.25	1.1±1.25	0.6±0.87	0.9±1.02	0.8±1.19	0.9±1.23
Vision: Problems seeing; double vision; eye, brain, or nerve injuries that interfere with seeing	1±1	1.4±1.21	0.9±1.02	1.2±0.94	1.2±1.08	1.3±0.94
Audition: Problems hearing; ringing in the ears	1.8±1.19	1.7±1.07	1.9±1.21	1.6±0.92	1.8±1.18	1.9±1.1
Dizziness: Feeling unsteady, dizzy, light-headed	1.4±1.13	1.4±1.09	1.4±1.23	1.5±1.07	1.2±1.07	1.4±1.08

Motor speech: Abnormal clearness or rate of speech; stuttering	1±1.07	0.8±0.99	0.9±0.88	0.8±0.92	0.7±0.94	0.9±1.05
Verbal communication: Problems expressing or understanding language	0.9±1.06	0.8±0.94	0.8±0.99	0.8±0.79	0.8±1.02	0.9±1.06
Nonverbal communication: Restricted or unusual gestures or facial expressions; talking too much or not enough; missing nonverbal cues from others	1±1.08	0.9±1.07	1±1.14	0.8±1.02	0.6±0.9	1.1±1.21
Attention/Concentration: Problems ignoring distractions, shifting attention, keeping more than one thing in mind at a time	2.5±1.17	2.2±1.32	2.1±0.99	2.1±1.17	2.2±1.19	1.9±1.27
Memory: Problems learning and recalling new information	2.4±1.22	2.3±1.14	2.3±1.17	2.3±1.08	2.3±1	2.3±1.23
Fund of Information: Problems remembering information learned in school or on the job; difficulty remembering information about self and family from years ago	2±1.1	2±1.4	1.8±1.2	1.8±1.11	1.6±1.13	1.7±1.18
Novel problem-solving: Problems thinking up solutions or picking the best solution to new problems	1.3±1.09	1.4±1.21	1.2±1.03	1.1±0.98	1±1.15	1.2±1.12
Visuospatial abilities: Problems drawing, assembling things, route-finding, being visually aware on both the left and right sides	0.8±1.03	1±1.15	0.6±0.95	0.9±0.94	0.7±0.96	1±1.07
Anxiety: Tense, nervous, fearful, phobias, nightmares, flashbacks of stressful events	2.4±1.16	2.9±1.08	2.2±1.26	2.8±0.8	2.4±0.99	2.6±0.89
Depression: Sad, blue, hopeless, poor appetite, poor sleep, worry, self-criticism	2.1±1.14	2.5±1.24	1.9±0.99	2.5±0.92	1.8±1.27	2.3±1.26
Irritability, anger, aggression: Verbal or physical expressions of anger	2.3±1.12	2.5±1.27	2±1.09	2.4±0.92	2±1.34	2.1±1.12
Pain and headache: Verbal and nonverbal expressions of pain; activities limited by pain	2.8±1.04	2.9±0.94	2.2±1.1	2.4±1.23	2.6±1.2	2.2±1.27
Fatigue: Feeling tired; lack of energy; tiring easily	2.1±1.25	2.6±1.18	1.9±1.09	2.3±0.98	1.7±1.12	2.3±1.3
Sensitivity to mild symptoms: Focusing on thinking, physical or emotional problems attributed to brain injury; rate only how concern or worry about these symptoms affects current functioning over and above the effects of the symptoms themselves	1.9±1.11	2.2±1.18	1.7±1.06	1.8±1.13	1.8±1.06	2±1.16
Inappropriate social interaction: Acting childish, silly, rude, behavior not fitting for time and place	1±0.93	1.3±1.39	1.3±1	1.3±1.16	0.9±1.06	1.3±1.26
Impaired self-awareness: Lack of recognition of personal limitations and disabilities and how they interfere with everyday activities and work or school	1.1±1.05	1.3±1.46	1.3±1.17	1.3±1.12	0.9±1.06	1.2±1.12

Family/significant relationships: Interactions with close others; describe stress within the family or those closest to the person with brain injury; "family functioning" means cooperating to accomplish those tasks that need to be done to keep the household...	1.7±1.06	1.7±1.31	1.5±1.07	1.8±1.08	1.5±1.3	1.7±1.32
Initiation: Problems getting started on activities without prompting	1.4±1.38	1.6±1.18	1.5±1.11	1.7±1.15	1.3±1.13	1.4±1.15
Social contact with friends, work associates, and other people who are not family, significant others, or professionals	1.7±1.23	1.9±1.41	1.9±1.17	2±1.28	1.8±1.17	2±1.4
Leisure and recreational activities	2±1.35	2.1±1.36	1.7±1.06	1.8±1.4	1.9±1.26	1.8±1.42
Self-care: Eating, dressing, bathing, hygiene	0.5±0.86	0.6±0.9	0.4±0.79	0.5±0.64	0.4±0.81	0.6±0.85
Residence: Responsibilities of independent living and homemaking (such as, meal preparation, home repairs and maintenance, personal health maintenance beyond basic hygiene including medication management) but NOT including managing money	0.6±1.07	0.7±1.25	0.9±1.08	0.7±0.85	0.8±1.33	0.6±0.88
Transportation	0.3±0.7	0.6±0.9	0.3±0.44	0.5±0.88	0.2±0.43	0.4±0.74
PAID EMPLOYMENT: Select the best answer which describes your paid employment. Support means special help from another person with responsibilities (such as, a job coach or shadow, tutor, helper) or reduced responsibilities. Modifications to the physical	0.9±1.56	0.7±1.32	1±1.59	1.3±1.7	1±1.5	0.6±1.36
OTHER EMPLOYMENT: Involved in constructive, role-appropriate activity other than paid employment such as child rearing/care-giving homemaker, no childrearing or care-giving, Student Volunteer or Retired. Support means special help from another person with	2±1.87	2.4±1.82	1.3±1.72	1.5±1.68	2.3±1.75	2.7±1.49
Managing money and finances: Shopping, keeping a check book or other bank account, managing personal income and investments; if independent with small purchases but not able to manage larger personal finances or investments, rate 3 or 4.	0.9±1.24	1.5±1.38	0.9±1.13	1.3±1.08	1.1±1.26	1.4±1.21
Pre-injury Alcohol use: Use of alcoholic beverages.	0.4±0.93	0.7±0.84	0.4±0.57	0.6±0.84	0.4±0.58	0.4±0.64
Post-injury Alcohol use: Use of alcoholic beverages.	0.6±0.72	0.9±0.96	0.9±0.92	0.9±1.21	0.8±0.86	0.9±1.13
Pre-injury Drug use: Use of illegal drugs or abuse of prescription drugs.	0.1±0.51	0±0.19	0.2±0.5	0±0	0±0.2	0±0.19
Post-injury Drug use: Use of illegal drugs or abuse of prescription drugs.	0.2±0.61	0.2±0.79	0.2±0.39	0.3±0.53	0.1±0.27	0.3±0.81
Pre-injury Psychotic Symptoms: Hallucinations, delusions, other persistent severely distorted perceptions of reality.	0±0.18	0.2±0.68	0.3±0.8	0.2±0.5	0.2±0.82	0.1±0.6

Post-injury Psychotic Symptoms: Hallucinations, delusions, other persistent severely distorted perceptions of reality.	0.9±1.07	1.1±1.29	0.8±1.04	1±1.1	0.6±0.94	1±1.27
Pre-injury Law violations: History before and after injury.	0±0.18	0.1±0.41	0±0.19	0.2±0.61	0.1±0.43	0.1±0.42
Post-injury Law violations: History before and after injury.	0.2±0.63	0.2±0.62	0.2±0.63	0.3±0.65	0.2±0.65	0.3±0.78
Pre-injury - Other condition causing physical impairment: Physical disability due to medical conditions other than brain injury, such as, spinal cord injury, amputation.	0.2±0.57	0.4±0.86	0.2±0.55	0.3±0.72	0.3±0.98	0.2±0.7
Post-injury - Other condition causing physical impairment: Physical disability due to medical conditions other than brain injury, such as, spinal cord injury, amputation.	1.7±1.32	1.6±1.38	1.6±1.26	1.7±1.51	1.7±1.49	1.7±1.39
Pre-injury - Other condition causing cognitive impairment: Cognitive disability due to nonpsychiatric medical conditions other than brain injury, such as, dementia, stroke, developmental disability.	0.1±0.43	0.2±0.68	0.1±0.26	0.2±0.57	0.2±0.86	0.1±0.42
Post-injury - Other condition causing cognitive impairment: Cognitive disability due to nonpsychiatric medical conditions other than brain injury, such as, dementia, stroke, developmental disability.	0.4±0.72	0.8±1.18	1±1.2	0.8±1.1	0.7±0.93	0.6±0.93

#### Mayo-Portland Adaptability Inventory-4

MIAMI Mean ± STD	BASELINE		6 MO		12 MO	
	N=30 STUDY	N=29 CONTROL	N=28 STUDY	N=28 CONTROL	N=26 STUDY	N=27 CONTROL
MPAI-4: Ability Index Score	18.7±9.81	17.5±10.76	18.4±8.74	16.7±10.49	17.2±10.59	16.9±12.43
MPAI-4: Adjustment Index Score	27.3±10.25	25.1±12.19	24.9±10.14	25.8±11.94	24.6±11.14	24.9±13.16
MPAI-4: Participation Index Score	10.8±6.55	10±7.48	10.3±6.21	11±7.71	10±7.44	11.1±8.45
MPAI-4: Total Score	50.4±22.19	46.8±24.66	47.7±20.55	47.2±24.97	46.1±24.86	47±29.07
MPAI-4: Total T-Score	54.1±8.19	52.7±9.15	53.2±7.73	52.6±10.24	52.3±10.08	52±12.31
MPAI-4: Ability Index T-Score	51.6±9.22	50.1±11.19	51.3±8.3	48.1±13.37	49.6±11.72	48.1±14.9
MPAI-4: Adjustment Index T-Score	58.1±8.71	56.4±11.83	56.2±9.34	56.3±12.86	55.8±9.71	56.1±11.86
MPAI-4: Participation Index T-Score	47±12.64	45.1±16.68	45.9±14.06	47.7±15.94	45.4±16.93	45.6±19.53
Mobility: Problems walking or moving; balance problems that interfere with moving about.	1.5±1.17	1.5±1.43	1.6±1.17	1.5±1.27	1.3±1.07	1.4±1.35
Use of hands: Impaired strength or coordination in one or both hands	0.9±0.94	0.8±1.25	1.1±1.12	1.1±1.19	0.9±1.19	1±1.15
Vision: Problems seeing; double vision; eye, brain, or nerve injuries that interfere with seeing	0.9±1.03	0.9±1.17	0.9±0.9	0.9±1.16	1±1.08	0.9±1.13
Audition: Problems hearing; ringing in the ears	2.5±1.17	2.3±1.32	2.1±1.18	2.1±1.28	1.8±1.34	1.9±1.35
Dizziness: Feeling unsteady, dizzy, light-headed	1.6±1.1	1.7±1.06	1.6±0.91	1.2±1.11	1.3±1.07	1.2±1.09

Motor speech: Abnormal clearness or rate of speech; stuttering	1.1±0.99	0.9±1.08	0.9±0.86	0.8±0.94	0.9±1.17	1.1±1.18
Verbal communication: Problems expressing or understanding language	1.2±1.1	1.1±1.16	1.3±0.84	1±1.09	1.2±1.25	1.1±1.22
Nonverbal communication: Restricted or unusual gestures or facial expressions; talking too much or not enough; missing nonverbal cues from others	1.2±1.22	1.1±1.06	1.1±0.98	0.7±1.04	1±1.26	1.1±1.31
Attention/Concentration: Problems ignoring distractions, shifting attention, keeping more than one thing in mind at a time	2.6±1.14	2.3±1.21	2.3±1	2.2±1.21	2.3±1.14	2.3±1.34
Memory: Problems learning and recalling new information	2.5±1.22	2.4±1.33	2.6±1.23	2.3±1.34	2.4±1.25	2.2±1.43
Fund of Information: Problems remembering information learned in school or on the job; difficulty remembering information about self and family from years ago	2.2±1.22	1.9±1.48	2.4±0.99	2±1.39	2.1±1.26	1.9±1.45
Novel problem-solving: Problems thinking up solutions or picking the best solution to new problems	1.4±1.19	1.5±1.41	1.3±1.09	1.6±1.24	1.5±1.29	1.3±1.34
Visuospatial abilities: Problems drawing, assembling things, route-finding, being visually aware on both the left and right sides	0.9±1.3	0.8±1.03	1.1±1.31	1±1.24	1±1.26	1.2±1.23
Anxiety: Tense, nervous, fearful, phobias, nightmares, flashbacks of stressful events	3±1.03	3±1.17	2.6±1.17	2.9±1.16	2.7±1.17	2.6±1.24
Depression: Sad, blue, hopeless, poor appetite, poor sleep, worry, self-criticism	2.7±1.11	2.7±1.02	2.6±1.13	2.7±1.07	2.6±1.23	2.6±1.3
Irritability, anger, aggression: Verbal or physical expressions of anger	2.9±1.06	2.8±1.12	2.5±1.17	2.7±1.26	2.8±1.14	2.6±1.24
Pain and headache: Verbal and nonverbal expressions of pain; activities limited by pain	2.9±1.14	2.5±1.22	2.5±1.1	2.4±1.15	2.6±1.12	2.3±1.4
Fatigue: Feeling tired; lack of energy; tiring easily	2.8±1.02	2.5±1.14	2.5±0.92	2.3±1.26	2.6±0.95	2.3±1.39
Sensitivity to mild symptoms: Focusing on thinking, physical or emotional problems attributed to brain injury; rate only how concern or worry about these symptoms affects current functioning over and above the effects of the symptoms themselves	2.4±1.25	2.1±1.41	2.2±1.16	2.3±1.32	2±1.26	2.1±1.44
Inappropriate social interaction: Acting childish, silly, rude, behavior not fitting for time and place	1.4±1.3	1.4±1.38	1.5±1.14	1.3±1.46	1.5±1.08	1.7±1.53
Impaired self-awareness: Lack of recognition of personal limitations and disabilities and how they interfere with everyday activities and work or school	1.5±1.36	1.4±1.45	1.5±1.23	1.5±1.4	1.4±1.32	1.7±1.49

Family/significant relationships: Interactions with close others; describe stress within the family or those closest to the person with brain injury; "family functioning" means cooperating to accomplish those tasks that need to be done to keep the household...	2.6±0.93	2±1.45	2.1±1.03	2.1±1.41	1.7±1.28	2±1.38
Initiation: Problems getting started on activities without prompting	1.9±1.34	1.9±1.31	1.9±1.15	2.2±1.34	1.6±1.19	1.9±1.37
Social contact with friends, work associates, and other people who are not family, significant others, or professionals	2.1±1.38	2±1.6	2.1±1.35	2.1±1.4	2.2±1.3	2.1±1.46
Leisure and recreational activities	2.3±1.45	1.8±1.44	2±1.37	2±1.43	1.9±1.41	1.8±1.47
Self-care: Eating, dressing, bathing, hygiene	0.5±0.94	0.7±1.08	0.8±1.04	0.9±1.36	0.8±1.09	1.2±1.37
Residence: Responsibilities of independent living and homemaking (such as, meal preparation, home repairs and maintenance, personal health maintenance beyond basic hygiene including medication management) but NOT including managing money	0.9±1.11	1±1.27	1±1.17	1±1.48	0.8±1.19	1.4±1.48
Transportation	0.4±0.96	0.5±0.9	0.5±1	1±1.39	0.8±1.35	0.9±1.28
PAID EMPLOYMENT: Select the best answer which describes your paid employment. Support means special help from another person with responsibilities (such as, a job coach or shadow, tutor, helper) or reduced responsibilities. Modifications to the physical	1.7±1.74	1.3±1.73	0.9±1.61	1.3±1.65	1.4±1.78	0.5±1.07
OTHER EMPLOYMENT: Involved in constructive, role-appropriate activity other than paid employment such as child rearing/care-giving homemaker, no childrearing or care-giving, Student Volunteer or Retired. Support means special help from another person with	2.1±1.68	2±1.75	2±2.09	1.5±1.29	1.7±2	2.4±1.51
Managing money and finances: Shopping, keeping a check book or other bank account, managing personal income and investments; if independent with small purchases but not able to manage larger personal finances or investments, rate 3 or 4.	1.4±1.59	1.1±1.22	1.3±1.42	1.4±1.48	1.2±1.55	1.4±1.4
Pre-injury Alcohol use: Use of alcoholic beverages.	0.3±0.53	0.4±0.81	0.4±0.63	0.5±0.87	0.5±0.77	0.1±0.44
Post-injury Alcohol use: Use of alcoholic beverages.	0.7±1.02	1±1.19	0.8±1.26	0.6±0.82	0.5±0.71	0.9±0.99
Pre-injury Drug use: Use of illegal drugs or abuse of prescription drugs.	0±0.18	0.1±0.55	0.1±0.42	0±0.19	0±0.2	0.1±0.37
Post-injury Drug use: Use of illegal drugs or abuse of prescription drugs.	0±0.18	0.1±0.25	0.3±0.84	0.1±0.31	0.1±0.44	0.1±0.35
Pre-injury Psychotic Symptoms: Hallucinations, delusions, other persistent severely distorted perceptions of reality.	0.2±0.66	0.1±0.73	0.2±0.67	0.2±0.77	0.2±0.62	0.1±0.52



Post-injury Psychotic Symptoms: Hallucinations, delusions, other persistent severely distorted perceptions of reality.	0.5±0.94	0.8±1.3	0.4±1.03	0.7±0.93	0.4±0.87	1±1.21
Pre-injury Law violations: History before and after injury.	0.2±0.59	0±0	0.1±0.57	0.1±0.37	0±0	0±0
Post-injury Law violations: History before and after injury.	0.1±0.31	0.4±0.67	0.2±0.39	0.2±0.38	0.2±0.5	0.4±0.78
Pre-injury - Other condition causing physical impairment: Physical disability due to medical conditions other than brain injury, such as, spinal cord injury, amputation.	0.1±0.43	0.3±0.69	0.3±0.8	0.4±1.09	0.3±0.74	0±0
Post-injury - Other condition causing physical impairment: Physical disability due to medical conditions other than brain injury, such as, spinal cord injury, amputation.	1.5±1.38	1.4±1.45	1.3±1.44	1.6±1.38	1.8±1.25	1.4±1.57
Pre-injury - Other condition causing cognitive impairment: Cognitive disability due to nonpsychiatric medical conditions other than brain injury, such as, dementia, stroke, developmental disability.	0±0.18	0.2±0.53	0.2±0.79	0.3±0.75	0.2±0.66	0.2±0.83
Post-injury - Other condition causing cognitive impairment: Cognitive disability due to nonpsychiatric medical conditions other than brain injury, such as, dementia, stroke, developmental disability.	0.8±1.19	1.2±1.47	0.9±1.36	0.9±1.35	1.4±1.47	1.1±1.42

### The Alcohol Use Disorders Identification Test: (AUDIT)

TAMPA MEAN $\pm$ STD Lower Mean is Better	BASELINE		6 MO		12 MO	
	N=30 STUDY	N=29 CONTROL	N=28 STUDY	N=28 CONTROL	N=26 STUDY	N=27 CONTROL
AUDIT SCORE	7.4 $\pm$ 6.94	8 $\pm$ 8	6.5 $\pm$ 5.5	8.2 $\pm$ 8.15	5.7 $\pm$ 3.84	7.4 $\pm$ 7.88
How often do you have a drink containing alcohol?	0.3 $\pm$ 0.92	0.3 $\pm$ 0.77	0.1 $\pm$ 0.38	0.4 $\pm$ 1.14	0 $\pm$ 0	0.4 $\pm$ 1.11
How many alcoholic drinks do you have on a typical day when you are drinking?	1.1 $\pm$ 1.72	0.6 $\pm$ 1.32	0.8 $\pm$ 1.47	0.9 $\pm$ 1.49	0.6 $\pm$ 1.24	0.6 $\pm$ 1.45
How often do you have 6 or more drinks on one occasion?	1.1 $\pm$ 1.27	1.3 $\pm$ 1.39	1 $\pm$ 0.87	1.2 $\pm$ 1.18	1.1 $\pm$ 1.08	1.2 $\pm$ 1.12
How often during the past year have you found that you drank more or for a longer time than you intended?	0.9 $\pm$ 1.31	1 $\pm$ 1.2	0.8 $\pm$ 0.91	1 $\pm$ 1.17	0.7 $\pm$ 0.96	1 $\pm$ 1.11
How often during the past year have you failed to do what was normally expected of you because of your drinking?	0.4 $\pm$ 0.86	0.5 $\pm$ 0.87	0.3 $\pm$ 0.75	0.5 $\pm$ 0.96	0.3 $\pm$ 0.76	0.6 $\pm$ 0.77
How often during the past year have you had a drink in the morning to get yourself going after a heavy drinking session?	0 $\pm$ 0.18	0.4 $\pm$ 1.09	0.2 $\pm$ 0.47	0.3 $\pm$ 0.84	0 $\pm$ 0.2	0.4 $\pm$ 0.96
How often during the past year have you felt guilty or remorseful after drinking?	0.4 $\pm$ 0.86	0.7 $\pm$ 1.23	0.4 $\pm$ 0.64	0.6 $\pm$ 1.08	0.3 $\pm$ 0.53	0.7 $\pm$ 1.06
How often during the past year have you been unable to remember what happened the night before because of your drinking?	0.4 $\pm$ 0.86	0.6 $\pm$ 1.01	0.4 $\pm$ 0.76	0.8 $\pm$ 1.13	0.3 $\pm$ 0.53	0.6 $\pm$ 1.07
Have you or anyone else been injured as a result of your drinking?	1.2 $\pm$ 0.46	1.2 $\pm$ 0.38	1 $\pm$ 0.19	1.2 $\pm$ 0.57	1 $\pm$ 0	1.2 $\pm$ 0.56
Has a relative, friend, doctor, or health care worker been concerned about your drinking, or suggested that you cut down?	1.6 $\pm$ 0.86	1.3 $\pm$ 0.66	1.4 $\pm$ 0.74	1.5 $\pm$ 0.74	1.3 $\pm$ 0.62	1.3 $\pm$ 0.72

### The Alcohol Use Disorders Identification Test: (AUDIT)

MIAMI MEAN $\pm$ STD <i>Lower Mean is Better</i>	BASELINE N=30		6 MO N=28		12 MO N=25	
	STUDY	CONTROL	STUDY	CONTROL	STUDY	CONTROL
AUDIT SCORE	7.8 $\pm$ 6.28	6.8 $\pm$ 5.74	9.2 $\pm$ 5.71	7.1 $\pm$ 5.63	6.3 $\pm$ 4.43	6.5 $\pm$ 6.67
How often do you have a drink containing alcohol?	0.3 $\pm$ 0.76	0.2 $\pm$ 0.61	0.4 $\pm$ 0.78	0.1 $\pm$ 0.37	0.2 $\pm$ 0.66	0 $\pm$ 0
How many alcoholic drinks do you have on a typical day when you are drinking?	0.8 $\pm$ 1.45	1.1 $\pm$ 1.64	0.9 $\pm$ 1.38	0.8 $\pm$ 1.36	0.4 $\pm$ 1	0.7 $\pm$ 1.34
How often do you have 6 or more drinks on one occasion?	1 $\pm$ 1.07	1 $\pm$ 1.08	1.4 $\pm$ 1.01	1 $\pm$ 1.13	1 $\pm$ 0.85	1 $\pm$ 1.11
How often during the past year have you found that you drank more or for a longer time than you intended?	1 $\pm$ 0.91	0.8 $\pm$ 0.82	0.8 $\pm$ 0.83	0.8 $\pm$ 1.1	0.8 $\pm$ 0.86	0.7 $\pm$ 0.99
How often during the past year have you failed to do what was normally expected of you because of your drinking?	0.6 $\pm$ 0.74	0.3 $\pm$ 0.64	0.6 $\pm$ 0.83	0.4 $\pm$ 0.7	0.1 $\pm$ 0.35	0.4 $\pm$ 0.73
How often during the past year have you had a drink in the morning to get yourself going after a heavy drinking session?	0.2 $\pm$ 0.51	0.1 $\pm$ 0.57	0.5 $\pm$ 0.96	0.2 $\pm$ 0.49	0.3 $\pm$ 0.46	0.2 $\pm$ 0.75
How often during the past year have you felt guilty or remorseful after drinking?	0.7 $\pm$ 0.85	0.3 $\pm$ 0.53	0.8 $\pm$ 1.13	0.5 $\pm$ 0.81	0.5 $\pm$ 0.99	0.4 $\pm$ 0.8
How often during the past year have you been unable to remember what happened the night before because of your drinking?	0.6 $\pm$ 0.98	0.4 $\pm$ 0.68	0.5 $\pm$ 0.61	0.6 $\pm$ 1.06	0.3 $\pm$ 1.05	0.5 $\pm$ 0.8
Have you or anyone else been injured as a result of your drinking?	1.2 $\pm$ 0.38	1.1 $\pm$ 0.31	1.2 $\pm$ 0.39	1 $\pm$ 0.19	1.1 $\pm$ 0.33	1 $\pm$ 0
Has a relative, friend, doctor, or health care worker been concerned about your drinking, or suggested that you cut down?	1.4 $\pm$ 0.72	1.5 $\pm$ 0.82	1.4 $\pm$ 0.69	1.4 $\pm$ 0.68	1.2 $\pm$ 0.5	1.3 $\pm$ 0.67

### Craig Handicap Assessment and Reporting Technique - Short Form (CHART-SF)

TAMPA	Baseline		6 MO		12 MO	
Mean $\pm$ STD	N=30	N=29	N=28	N=28	N=26	N=27
Higher Mean is Better	STUDY	CONTROL	STUDY	CONTROL	STUDY	CONTROL
Cognitive Independence	77.5 $\pm$ 26.27	69.9 $\pm$ 28.65	73.2 $\pm$ 26.26	62.9 $\pm$ 30.26	74.7 $\pm$ 29.75	70.7 $\pm$ 26.35
Economic Self Sufficiency	81.4 $\pm$ 25.9	83.3 $\pm$ 26.26	82.7 $\pm$ 24.27	86.7 $\pm$ 25.67	80.4 $\pm$ 29.17	77.4 $\pm$ 22.75
Mobility	88.8 $\pm$ 15.34	85.6 $\pm$ 19.51	86.3 $\pm$ 18.62	85.6 $\pm$ 16.96	88.3 $\pm$ 14.1	87.1 $\pm$ 19.11
Occupation	83.1 $\pm$ 29.79	75.4 $\pm$ 35.05	81.7 $\pm$ 29.11	72.9 $\pm$ 36.43	85.4 $\pm$ 26.68	82.2 $\pm$ 30.96
Physical Independence	89.6 $\pm$ 25.22	81.7 $\pm$ 39.27	86.1 $\pm$ 25.57	95.4 $\pm$ 13.1	89.2 $\pm$ 21.67	83.9 $\pm$ 29.4
Social Integration	82.4 $\pm$ 21.06	79.3 $\pm$ 25.22	83.7 $\pm$ 18.62	74.1 $\pm$ 27.04	85.2 $\pm$ 19.64	76.4 $\pm$ 25.93

### Craig Handicap Assessment and Reporting Technique - Short Form (CHART-SF)

MIAMI	Baseline		6 MO		12 MO	
Mean $\pm$ STD	N=30	N=30	N=28	N=29	N=25	N=29
Higher Mean is Better	STUDY	CONTROL	STUDY	CONTROL	STUDY	CONTROL
Cognitive Independence	76.4 $\pm$ 25.16	74.4 $\pm$ 28.79	73.3 $\pm$ 27.87	62.9 $\pm$ 32.15	73 $\pm$ 32.57	64.4 $\pm$ 30.35
Economic Self Sufficiency	71.5 $\pm$ 31.94	82.1 $\pm$ 22.89	74.4 $\pm$ 29.3	82.1 $\pm$ 18.82	69.6 $\pm$ 30.06	82.1 $\pm$ 25.7
Mobility	84.5 $\pm$ 22.92	84.6 $\pm$ 18.67	80.4 $\pm$ 24.47	74.7 $\pm$ 25.75	79.2 $\pm$ 20.46	77.4 $\pm$ 22.5
Occupation	77.2 $\pm$ 35.24	79.1 $\pm$ 35.63	72.6 $\pm$ 34.62	86.3 $\pm$ 32.36	73.7 $\pm$ 38.23	81.8 $\pm$ 34.98
Physical Independence	87.6 $\pm$ 23.68	85.9 $\pm$ 26.78	86 $\pm$ 41.75	79.3 $\pm$ 40.53	51.2 $\pm$ 126.71	68.6 $\pm$ 58.61
Social Integration	75.5 $\pm$ 28.64	77.2 $\pm$ 30.77	72.8 $\pm$ 27.23	71.4 $\pm$ 29.41	68.3 $\pm$ 31.47	73.6 $\pm$ 31.42

**Conclusion:** Veterans are appreciative of care provided and strive to maximize care coordination with the intervention nurse.

#### **Problem Areas**

At this time we do not anticipate any problems in completing the project on schedule.

#### **A description of work to be performed during the next reporting period.**

We have completed enrollment at Tampa and Miami. We have begun preliminary data analysis and will report the results in our upcoming quarterly reports.

## References

<sup>1</sup> Malec, J. (2005). The Mayo Portland Adaptability Inventory. *The Center for Outcome Measurement in Brain Injury*. <http://www.tbims.org/combi/mpai> (accessed October 19, 2009).

<sup>2</sup> Malec, J.F. (2004). Comparability of Mayo-Portland Adaptability Inventory ratings by staff, significant others, and people with acquired brain injury; 2004, *Brain Injury*, 18, 563-575.

<sup>3</sup> Fox-Rushby JA Hanson K, Calculating and presenting disability adjusted life years (DALYs) in cost effectiveness analysis, 2001, *Health Policy and Planning* 16(3): 326-331.

<sup>4</sup> <http://tbims.org/combi/chartsf/>